



U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Ocean Service
Office of Response and Restoration
Assessment and Restoration Division
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November 14, 2016

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Dear Tanya:

The National Oceanic and Atmospheric Administration (NOAA) is one of the natural resource trustees (“Trustees”) for the Raritan Bay Slag Superfund Site (“Site”) in Old Bridge Township, New Jersey. The Trustees, NOAA on behalf of the Department of Commerce, the U.S. Fish and Wildlife Service (USFWS) on behalf of the Department of the Interior, and the New Jersey Department of Environmental Protection (NJDEP) on behalf of the State of New Jersey are currently assessing injuries to natural resources at the Site due to the release and threat of release of hazardous substances (e.g., metals from slag) as part of a natural resource damage assessment (NRDA). The Trustees most recently sent EPA a letter on February 3, 2015 seeking EPA’s cooperation to partner with us on integrating remediation and restoration at this Site.

To further this partnership, NOAA has reviewed three May 2016 Region 2 RAC2 Remedial Action Contract remedial design documents for the Raritan Bay Slag Superfund Site in Old Bridge Township, New Jersey related to proposed remedial actions in the Margaret’s Creek Sector: the, Pre-Final Design Analysis Report, the Pre-Final Specifications and the Pre-Final Design Contract Drawing. Our comments focus on three issues: spatial resolution of remedial design sampling, remedial design data, and site restoration. We would appreciate working cooperatively with you to address these concerns to improve the protectiveness of the remedy, enhance primary restoration and integrate remediation and restoration.

Spatial Resolution of Remedial Design Sampling

Based on the figures included in the DAR, it doesn’t appear that any significant effort was undertaken during the remedial design to better characterize the degree and extent of contamination in Margaret’s Creek marsh through gridded or randomized probability based

sampling. Sample A9-GEOW collected during the 2011 Remedial Investigation (RI) is located in the open water section of Margaret's Creek marsh northwest of the Old Bridge Municipal Utility Authority (OBMUA) fire access road. This sample was measured with lead above 400 ppm but the area is not targeted for remediation. The nearest samples are between 150 and 275 feet away. Additional samples should be collected to confirm whether areas of the marsh are contaminated with lead above the 400 ppm clean up trigger and therefore require remediation. In addition, Figure 9 of the Delineation Report displays the limit of moderate wave action extending upstream of the Route 35 culvert, suggesting that a limited amount of sampling south of Route 35 should have been conducted to confirm contamination is below the 400 ppm lead cleanup trigger.

SB003 area is not targeted for remediation with the rest of the Margaret's Creek Sector. Rather SB003 will be remediated at a later date in conjunction with the Seawall Sector due to access issues. Unless the slope drains toward the Seawall Sector, the unremediated contamination will continue to be a source of contamination to the Margaret Creek marsh. Maybe surface flow can be directed away from the marsh in this area as a precaution until the Seawall Sector work is implemented.

The revised Figure 1-4 depicts soil and sediment sampling locations, test pits, areas with slag and battery casings, and the Remedial Investigation (RI) slag areas. The RI Slag area closest to Route 35 does not appear to be targeted for remediation at least the areas off of the OBMUA access road. Will additional samples be collected from this area to determine the need for excavation?

Revised Table 1-2 in combination with the DAR Figure 1-4 and Revised Figure 1-4 suggest that some surface sediments were remediated using Sandy funds where the 0-2 inches below grade was subsequently tested post-remediation (See for example SB066 to SB148). Please confirm whether subsurface sampling will be conducted in these areas to verify whether additional excavation is required to target sediment and soils above the 400 ppm Pb and to meet the Remedial Action Objectives (RAOs).

Remedial Action Data

The Contract Specifications indicate that pre-excavation sampling and analysis will be conducted for sediments, soils, groundwater, surface water and waste characterization. NOAA requests that this data be shared as a database or spreadsheet as it becomes available. NOAA would also appreciate receiving the Electronic Data Deliverable (EDD) of pre- and post-excavation samples provided by the Contractor per Part 1.7.2.

The requested data will supplement the site-specific data already uploaded to our NY/NJ Harbor database which is publically available at <http://response.restoration.noaa.gov/environmental-restoration/environmental-assessment-tools/query-manager-marplot-data-maps.html>.

Wetland Delineation Report

The Study Area is described as 60.5 acres but how that Study Area was selected is not clear. The Study Area, as depicted, does not encompass the full wetland north of Route 35 (e.g., see for example Figures 2-5, 7 and 8), thus, the Study Area boundary appears inappropriate and the wetland delineation is incomplete. Alternatively, the polygon representing the Study Area may be incorrectly drawn and the entire wetlands north of Route 35 were delineated.

The wetland delineation report should provide the number of acres by habitat type that comprise the Study Area as depicted in Figure 11 and described on pages 206 to 209 of the pdf. Wetlands A, B and C should also be displayed on a map and the acreage of each of these areas should be reported on pages 153 to 154 of the pdf along with the acreage per vegetative community per wetland.

Site Restoration

The revised Figure 1-4 also shows a sediment-soil demarcation line. This line does not appear consistent with the soils and hydrology of the site or with the NWI and NJDEP wetland boundaries. There are places where the line extends into the marsh thereby delineating sediments as soils and vice versa. What is the basis of the sediment-soil demarcation line as the wetland delineation did not survey the entire marsh north of Route 35? Incorrectly marking the soil-sediment boundary can have profound impacts on how the site restoration is conducted.

Remediated areas will be backfilled to pre-remedial bathymetry except for open water areas which will be left in the remediated deeper condition. Margaret Creek's marsh is a drowned marsh and the proposal to not restore its bottom elevation to pre-remedial conditions will further degrade conditions in the marsh. NOAA recommends backfilling the open water areas to pre-remedial bathymetry. This will serve to create a more natural transition between open water and adjacent vegetated areas and will cover any contamination present in the exposed sediment surface at the bottom of the excavation.

There are no steep slopes in the Margaret's Creek Sector except those previously associated with placed fill subject of Record of Decision. Temporary slopes of 3H:1V or 2H:1V are proposed but final slopes are not identified. Final slopes should be consistent with pre-remedial non-fill area slopes at the site including the transition between open water and wetlands or open water and shoreline areas. Steep slopes can be avoided by backfilling open water areas to pre-remedial elevations.

The forested and freshwater wetland plant lists don't appear to account for species tolerance to salt. Survival of salt intolerant species may be lower, especially if the planted area is exposed to inundation of tidal waters. Figure 9 of the Wetland Delineation Report suggests that it is critical to consider current and future flooding of the site by saline waters in plant species selection. The

forested wetland tree species proposed for planting at the site include red maple, sycamore, swamp chestnut oak, and swamp white oak. Given that plantings are close to the tidal marsh and can be subject to tidal flooding, the success of salt intolerant species such as red maple, sycamore, and swamp chestnut oak will depend on the elevation and distance from the marsh. For example, red maple and sycamore can only tolerate salinity of less than 0.5 ppt. Grey birch, sweet gum and black gum are moderately salt tolerant species (tolerates infrequent flooding by water with some salt) and are common at the site. Although these species are not proposed for planting in the site restoration plan, they would be better choices than the listed low salt tolerant species. Is grey birch not included in the site restoration plan because of planting restrictions due to threat of Asian long-horned beetle? If so, red maple is also on the restricted list.

The proposed planting of the shrub layer of the forested wetland consists of groundsel tree, sweet pepperbush tree, highbush blueberry, pussy willow and silky dogwood. Silky dogwood is salt intolerant and may be less suitable for replanting at the site than some other recorded species. For example, buttonbush (*Cephalanthus occidentalis*) and black elderberry (*Sambucus canadensis*) should be added to the plant shrub list as they are salt tolerant species and were documented in the site shrub community. Similarly, selection of the herbaceous wetland seed mix should consider whether the seeded areas are likely to become flooded with saline waters for short or long-periods of time and whether the salinity tolerance of the species contained in the seed mix are compatible with anticipated site conditions given that a large area is within the 100-year flood zone. Again substituting salinity tolerant species for salinity non-tolerant species should be considered since at least one species in the seed mix is not salt tolerant.

An isolated freshwater wetland restoration is a component of site restoration. Insufficient information is provided to determine whether the site elevation precludes tidal flooding, the adaptability of the plant species to salinity, and what the likelihood for sustainability of this freshwater wetland habitat type is. One of the three freshwater herbaceous species identified for planting, Crimson-eyed rose mallow is a freshwater and brackish species tolerant to <15 parts per thousand (ppt) while blunt spikerush and soft rush are tolerant only to <0.5 ppt. Other herbaceous freshwater wetland species have varying degrees of tolerance to salt. These include common spike rush (*Eleocharis palustris*) for ephemeral and low lying transitional zones, arrow arum (*Peltandra virginica*, 1-2 ppt), pickerelweed (*Pontederia cordata*, 3 ppt), broadleaf arrowhead (*Sagittaria latifolia*, <0.5 ppt), deepwater duck potato ((*Sagittaria rigida*, <2 ppt and broadleaf cattail (*Typha latifolia*, <0.5 ppt). Narrowleaf cattail (*Typha angustifolia*) tolerates salinity to < 15 ppt, but is considered native and introduced. Areas that are more marginal and not persistently wet should be planted with facultative species. Areas that are persistently wet near the isolated marsh should only utilize plants that are of sufficient tolerance to salinity upward of 10 ppt.

NOAA requests shape files of the previously remediated areas, the proposed staging, containment, stockpiling, treatment, waste characterization, remediation and restoration areas (by habitat type) depicted in Contract Drawings C-2-C-8B. NOAA also requests shape files

depicting the wetland habitats delineated in April 2016 as shown in Figure 11 and wetlands identified as Wetland A, B and C.

Site restoration includes restoring saltmarsh, freshwater wetlands and forested wetlands. For the uplands site restoration is limited to seeding only. Figure 11 of the Wetland Delineation Report depicts vegetative communities identified on-site. This map along with Contract Drawings demonstrates that forested upland habitat (disturbed early successional forest and early successional forest) impacted by the remedy will be replaced with grasses. The Wetland Delineation Report described the upland habitat as consisting of mixed age forest species and late successional field patches within disturbed areas. Native trees, shrubs and other herbaceous plants removed during any site work including Sandy-funded surface sediment removal should be replanted with native species that will form a more natural habitat than the proposed lawn. Historic maps could be used to better identify what habitat existed prior to Sandy remedial work and what habitat likely existed prior to any dumping or fill at the site. The current herbaceous layer includes round-head bush clover, seaside goldenrod and switchgrass. The existing scrub shrub layer consists of native species such as groundsel tree, staghorn sumac, winged sumac, sweet gum, fetterbush, and black locust and the introduced and invasive species such as autumn olive. The tree layer is composed of red maple, black cherry, Eastern red cedar, black oak, red oak, white oak, tulip poplar, sweet gum, and black gum.

NOAA recommends that basal diameter height (DBH) and species of each cleared or trimmed tree be recorded noting whether the tree was removed or trimmed. This would provide the needed information for determining the site restoration of the forested wetland and uplands in terms of planting density and species composition. It is not clear from the DAR how an overall density of 194 trees per acre spaced 15 foot on center and 400 shrubs per acre spaced 10.5 foot on center was derived. Site observations would dictate a greater density and closer spacing than proposed.

The Site Restoration section states “The proposed wetland mitigation actions are designed to compensate for the wetland functional values lost or impaired by the alternation of wetlands for site remediation.” Yet the mitigation ratio appears to be 1:1. Please check with NJDEP to ascertain whether they will require more than 1:1 mitigation for impacts to the wetland habitats as part of their permit or permit equivalency. Replacing habitat on a 1:1 basis does not replace the function of the habitat lost or impaired to its pre-disturbed condition, which requires more time. It is why many entities require reconstruction at a rate of greater than 1:1. Our preference would be to mitigate greater than 1:1 to more fully compensate for the forested, saltmarsh and freshwater wetland function lost or impaired due to remedy implementation.

The tidal marsh currently is dominated by *Phragmites* but will be replanted with high marsh and low marsh species. The elevations for the high and low marsh should be specified to ensure that the areas are designed to optimally support the targeted species and to achieve survival, growth and sustainable native wetland cover.

Contract Specifications

Section 01388 - Project Photographs

GPS coordinates could be recorded for each photograph so that the photographs are georeferenced.

Section 01381 –Videotaping

GPS coordinates could be recorded for each video to provide geo-referencing for the recordings.

Section 01450 Chemical Data Quality Control

The project objective, described in Part 1.5.1.1 should include the removal of contaminated sediment, soil and waste (e.g., slag, batteries, other debris).

Part 1.5.1.2.3 indicates that topsoil and backfill designated for placement on the remediated site should be tested from each offsite source and should not contain contaminants above levels that are hazardous to human health or the environment. Yet the results are compared solely against NJDEP Non-Residential Direct Contact Soil Remediation Standards (NRDCSRS) and radiological criteria which are designed to protect human health. Backfill and topsoil analytical results should also be compared against NJ ecological screening criteria for sediment and soil to be protective of the ecological receptors (see http://www.nj.gov/dep/srp/guidance/ecoscreening/esc_table.pdf). The frequency of analyses should be specified (i.e., the 5,000 cubic yards (cy) of material or as requested by the EPA's Representative per Section 02201 Part 1.5.1. Sediment and soil pH, nutrients Total Organic Carbon (TOC), required by Part 1.5.2.3.2 and 1.5.2.3.4, should fall within optimal tolerances for restoration of native vegetation in wetland and upland areas.

Standard Reference Material (SRM) is available from the National Institute of Standards and Technology (NIST) and should be included in the list of QC sampling requirements specified in Part 1.6.2. An SRM should be run in every batch of one to 15 to 20 samples.

Section 01670 - Green Remediation Requirements

Part 3.3.2 requires that cleared material be chipped and reused on-site. Before this is done, samples should be tested to confirm that metals have not bioaccumulated to levels that are harmful to human health or the environment, i.e., above NJDEP ecological screening criteria.

Section 02201 – Backfill, Compaction, and Grading

To be protective of ecological health, the fill materials should also comply with NJDEP ecological screening criteria for soils and sediment. See http://www.nj.gov/dep/srp/guidance/ecoscreening/esc_table.pdf.

NOAA recommends using less large material as part of the Common Backfill requirement in Part 2.1: change the 1" U.S. Sieve Size to 85-100 Percent Passing.

Common backfill is the subgrade that is covered with varying thickness of topsoil. The rationale for difference depths of the upper topsoil layer, a minimum of 6 inches thick in the uplands or a minimum of 12 inches thick in wetlands is not apparent. Were the differences in topsoil thickness based on a decision to limit site restoration of the upland to an application of a seed mix? The appropriate amount of topsoil should be placed in the uplands to support a mix of a native herbaceous, shrubs and tree community. Also the contract should specify tolerance limits, as appropriate, around the thickness of structural backfill, common backfill and topsoil.

The 24-inch drainage pipe is a culvert connecting the bisected marsh. Consideration should be given to installing a larger pipe or more pipes under the OBMUA access road to improve the flow and improve the hydrologic connection between the two sections of the marsh.

Section 02230 – Clearing and Grubbing

We recommend measuring the basal diameter height (DBH) and recording species of each cleared tree noting whether the tree was removed or trimmed.

Part 3.1.4 states that "The *Phragmites* piles shall remain covered at all times during stockpiling and transport to prevent the spreading of seeds." *Phragmites* will be sprayed with herbicide, cleared and grubbed. Since *Phragmites* uptake metals, they should be handled as contaminated material. This should be articulated in Part 3.1.4.

Part 3.1.5 states "During site clearing activities the Contractor shall save 20 tree trunks 12 greater in diameter and cut into lengths of no less than 8 feet long, for use in the wetland restoration areas." Similarly, Part 3.4.1 states that "Cleared and chipped material shall be considered uncontaminated" and "with the exception of *Phragmites* shall be spread in areas outside of the site clearing." Before trees or other material are reused on-site, metal analyses should be conducted to confirm the material is not contaminated.

Section 3.3.2 requires the Contractor to repair all damage to trees, shrubs, and plants scheduled to remain, by properly dressing, cutting and painting damaged vegetation with acceptable tree wound paint, or replacing items that cannot be repaired. Will a wetland scientist or certified arborist weigh in on whether damaged plant material will be repaired or replaced? What corrective actions are in place if they are repaired and subsequently die?

Section 02921- Upland Seeding

This specification focuses on seeding grass seeds in the upland areas which is a dominant feature of the Site Restoration and isn't acceptable on its own. We recommend planting of a more natural native herbaceous, shrub and tree community to maintain habitat for local wildlife

species (e.g., birds, mammals, reptiles and amphibians). We support the use of seed mix #2 as a component of the forest and shrub layer. Seed mix #1 should be completely dropped and replaced by seed mix #2.. The tree and shrub list should be comparable to the species targeted for removal.

Section 02370 – Erosion Control and Stormwater Management

Part 3.1.3 addresses diversion of stormwater from the 24-inch drainage channel (culvert) connecting the two lobes of Margaret’s Creek wetland bisected by the OBMUA access road. To facilitate restoration of the hydrology of the marsh, NOAA recommends increasing the size of this culvert and/or adding more culverts under the OBMUA access road to reconnect the bifurcated marsh. This can be implemented as a supplemental step after contaminated soils, battery casings, slag or other wastes are removed but before the access road is reconstructed.

Part 3.1.4 indicates that stormwater in contact with contaminated soils will be collected and discharged to the Middlesex County Utilities Authority Publicly Owned Treatment Works or to surface water and that all other site run-off water will be sent to on-site streams. Please include the triggers for when stormwater that has come in contact with contamination will be discharged to surface water, e.g., only once it is treated, below NJ Surface Water Quality Standards. Please clarify whether the “all other site run-off water” constitutes water that is not in contact with contaminated materials or refers to something else.

Part 3.3.1.2 describes the use of hay balls or straw erosion checks and states “Bales shall be removed...”. Please modify this sentence to read “Bales and anchoring shall be removed...”.

Part 3.3.4 states “All sediment dropped, washed, or tracked onto Route 25 must be removed immediately.” Given the traffic on this road, it is not clear how this can be readily done safely.

Section 02900 – Site Restoration

Part 3.1 requires the Contractor remove all equipment and materials prior to demobilization of the site. Herbivory fencing may need to be retained for several years to ensure that the habitat reconstruction is successful and well-established. It is better to retain the fence and remove during Operations, Maintenance and Monitoring rather than remove at the end of the construction period.

Section 02921 – Upland Seeding

Upland habitat reconstruction should not be limited to seeding of grasses. This specification should be modified to include seeding of a native herbaceous seed mix, and planting of shrubs and trees. Seeds should be collected locally from native plant species. Seed source (where collected) should be part of the seed certification requirements of Part 1.3.2.

Part 2.1.2 suggests that fertilizer and lime are not typically used with temporary seedings while Parts 3.4.1.1 and 3.4.1.2 indicate that fertilizer and lime will be applied prior to applying the temporary seed mix.

Part 2.3.7.2 allows for the use of soil erosion control fabric constructed with non-biodegradable polypropylene yarn. Only biodegradable control fabric should be used on-site unless the erosion control fabric will be removed.

Part 3.2.1 requires topsoil placement to a minimum compacted depth of 6 inches. Elsewhere it is clarified that the thickness is a minimum of 6 inches in the uplands and 12 inches for wetlands. Is there an upper tolerance for the depth of backfill, e.g., no deeper than the thickness to return the disturbed area to pre-remedial elevation?

Part 3.2.2 allows for temporary soil slopes up to a maximum of 3H:1V. This is too steep for the final slopes such as the interface between wetlands and uplands and is not reflective of the slopes found at the site prior to remediation.

Part 3.8.3 should also require protection from herbivory.

Section 02955 - Freshwater Wetland Restoration

Part 1.1.1 explains that this specification will cover both freshwater and forested wetlands and that the term “freshwater wetlands” or “wetlands” will be used throughout the specification to cover both types of wetlands. But the specification then proceeds to use either “freshwater wetlands” or “forested wetlands” so it is not always clear when “freshwater wetlands” refers only to “freshwater wetlands” and when it refers to both freshwater and forested wetlands. Consideration should be given to drafting separate contract specifications for freshwater wetlands and forested wetlands based on how different these two types of habitats are.

Herbivory is addressed in Part 1.1.4.2 by the installation and maintenance of a deer enclosure fence. This fence may not preclude other herbivores such as geese, muskrats and mice that could compromise planned plantings. The DAR suggests that flagging will also be installed to prevent waterfowl and other birds from entering the area.

NOAA would appreciate receiving a copy of the Freshwater Wetland Restoration Plan for review and comment that will be submitted by the Contractor under Part 1.3.1.

Part 1.3.4. should state that plant stock should be native and local.

Part 1.3.6 indicates that the Contractor will maintain the freshwater wetland plants, seed, and restoration materials for a 1 year maintenance period. Who will maintain them after that, e.g.

separate Operations, Maintenance and Monitoring (OMM) contract? There should also be recognized that adaptive management should be part of the contract specification.

Part 2.1.1 indicates that the organic rich loam will have an organic content of 12-14%. This seems too high. An organic content of 5% would be more appropriate.

Part 2.1.2 requires the loam to be free of stones 1 inch in diameter or larger yet Part 3.2.5 requires the site to be free of stones greater than 2 inches in diameter.

Part 2.1.3 requires the use of sandy loam, loam or sandy clay loam as the top foot of backfill for forested wetlands. NOAA recommends that only sandy loam be used and be from native soil.

Part 2.1.4 allows for the use of loam or sandy loam as the top foot of backfill for freshwater wetlands. As with the forested wetlands, NOAA recommends that only sandy loam from native soil be used.

Part 2.1.8.1 allows for compost material to be comprised of biosolids, yard waste and agricultural waste, amongst other material. All compost material should not introduce chemical toxicants back into the remediation site above ecological screening levels.

Part 3.1.2 requires the subgrade to be restored with clean fill to 1 foot below grade. Is there any tolerance on this specification?

Part 3.2.3 requires finished grades to match pre-construction contours and transition smoothly to the surrounding undisturbed wetland contours. Similarly, shallow slopes should be used to transition to uplands. Slopes should be specified rather than saying "transition smoothly".

Part 3.2.4 prohibits the placement of organic rich loam in water, while frozen or muddy. How will the fill be placed in the freshwater wetland habitat with permanent water cover?

For Part 3.2.6, does "previously established grades" refer to pre-construction grades?

The DAR specifies planting dates as March 15-May 15 or Sept 15 to Nov 30 while this contract specification in Part 3.3.2 gives the dates as March 15-May 15 or Sept 30 to Nov 30. The dates should be consistent between the two documents. Also the window for planting emergent plants should be in the spring but after the last hard frost. The Sept 30 is the better start window for fall planting.

The salvaged tree trunks to be placed in the wetland restoration area should be pre-tested for metals and their concentrations compared to NJ ecological screening criteria before determining the acceptability of salvaged tree trunks for on-site reuse.

The herbivory exclusion fencing mentioned in Part 3.4.15 also needs to preclude waterfowl and muskrats while the herbivory exclusion fencing mentioned in Part 3.4.16 also needs to preclude girdling by mice.

The Wetland Seed Mix mentioned in Part 3.5.1 should be included in this specification.

Part 3.8.2 requires a minimum of 75% cover within one year of planting. For wetlands, there is usually, in addition, an 85% cover requirement within 5 years. Sometimes, there is also a functional requirement too. Typically, when planting trees and shrubs, there is a 90% or 95% survivability requirement.

Part 3.9.1.1 requires the drafting a Wetland Restoration Plan that will contain a Monitoring Plan covering a one year maintenance period. The return to pre-remedial conditions will occur over many years and will not be completed within the one year maintenance period. After the Final Inspection, another document should kick in to cover long-term monitoring and maintenance. Part 3.9.1.2 requires that the Monitoring Plan document the establishment of hydric soils, wetland plant community, and wetland hydrology. NOAA would appreciate the opportunity to review and comment on the restoration and monitoring plan.

Part 3.9.3.1 requires immediately supplemental planting where the 75% cover is not likely to be established based on findings of the Interim Inspection. The Interim Inspection occurs 3 months after the Initial Inspection following planting and seeding. The supplemental planting should occur at times optimal to plant survival and may have to be delayed to the appropriate planting window.

Part 3.9.5.1 With regard to monitoring oversight, what entity is going to enforce this standard as the NJDEP mitigation banking unit is understaffed.

Section 02957 - Salt Marsh

Part 1.1.1 suggests that salt marsh restoration will be implemented where said habitat is altered below or adjacent to the soil-sediment demarcation line by construction activities. As mentioned elsewhere the soil sediment demarcation line is drawn in a way that appears to reduce the size of the saltmarsh especially in the portion of saltmarsh to the northeast of the OBMUA access road.

Part 1.1.3 requires a minimum native marsh cover of 75% one year after the Initial Inspection and areas have been approved. Long term success criteria should also be established and maybe specified in NJDEP permit requirements. Typically performance criteria are set at 85% cover (structural) and also include functional requirements.

NOAA would appreciate the opportunity to receive and review the Salt Marsh Restoration Plan including the Monitoring Plan that with the Restoration Plan must be submitted by the Contractor, per Part 1.3.1, at least 90 calendar days prior to start of planting.

In Part 1.6.1.1, saltmarsh and brackish marsh plant stock must be obtained by the nursery from plants with a provenance from within a 150-mile radius of the planting site and grown within the 6A to 7B, inclusive, USDA Plant Hardiness Zones. It would be more appropriate for the

contract specification to refer to the relevant US EPA Ecoregion per the link <https://www.epa.gov/eco-research/ecoregion-download-files-state-region-2#pane-28>. The project site encompasses two ecoregions, both are classified as Level III Ecoregion 84. Laurence Harbor and Cheesapeake are within Ecoregion 84C, a small sub-region of coastal plain that is identified for most of the Atlantic coast saltmarsh. The upland fits within ecoregion 84D.

The proposed salt marsh topsoil specifications, listed in Part 2.1.3.2, should be modified to read 80% sand, 15% silt and clay, and 5% gravel. This material should be a natural soil, for example, a bank run.

Part 3.3.1 describes the planting of salt marsh plugs but doesn't mention an amendment of nitrogen. Typically fertilizer tablets are placed in the hole prior to installing the salt marsh plant plug. The contract specification should be modified to allow for its use. In contrast, fertilizer plugs are not typically used in freshwater wetlands as nitrogen is labile under those conditions.

While the Contractor shall provide long-term maintenance instructions for use by the EPA's Representative for maintenance beyond the Contractor's one-year maintenance period per Part 3.4.5, subsequent OMM should also be required. This could be described in a separate standalone document.

Part 3.5.1.1 requires the development of a Monitoring Plan that will be part of the Contractor's Salt Marsh Restoration Plan and will provide for a one-year maintenance period. We would appreciate the opportunity to review and comment on this document and recommend that a separate long-term monitoring plan be developed to assess site restoration.

Part 3.5.3.1 requires that approximately 3 months following the Initial Inspection, an "Interim Inspection will be performed. If it is determined that the 75 percent coverage requirements will not be achieved, the Contractor shall immediately supplement the plantings as necessary to achieve the required coverage. This may not be the best time to plant saltmarsh species as 3 months after initial planting could be the Fall.

Part 3.5.4.1 states that "If one year after planting, 75 percent reestablishment has not been achieved, the Contractor shall provide and plant additional plants as directed by the Government, at no additional cost to the Government." There should be a separate performance criteria (e.g., 85% cover within 5 years, function requirements such as benthic recovery) and long-term monitoring requirement under a separate OMM contract. Adaptive management should be part of the contract specification.

Contract Drawings

Contract Drawing C-8B: Tree and shrub spacing depicted in the Typical Tree Spacing Diagram is much greater than what one observes in the field. A tighter space than the random 10 foot on

center for shrubs and 15 foot on center for trees is recommended. Topography, soil type, soil depth, hydrology and habit of these species drive the establishment and success of planted species.

Contract Drawing C-8B provides details on the number of plants and plant spacings for reconstructed forested wetlands, saltmarsh, and freshwater wetlands. There appears to be no contract drawing for the replanting of the tree shrub layer in the uplands but this habitat type is impacted by the remedy and has been delineated and shown in Figure 11 of the Wetland Delineation Report. That Drawing should list the tree, shrub and seed mix for the uplands.

The Wetland Restoration Planting Schedule in Contract Drawing C-8B suggests that pickerelweed is one of the freshwater wetlands to be planted. This species is not listed on page 2-17 of the DAR under Site Restoration.

Please feel free to contact me at 212-637-3259 (lisa.rosman@noaa.gov) or my colleague Carl Alderson 732-371-0848 (carl.alderman@noaa.gov) of NOAA's Restoration Center if you want to further discuss these comments.

Sincerely

Lisa Rosman

NOAA Regional Resource Coordinator

Cc: Clay Stern, USFWS
Dave Bean, NJDEP
Kim Katzenbarger, NOAA